

REMARKS/ARGUMENTS

Upon entry of this Amendment, Claims 1-33, 58 and 59 will be pending in the application. Non-elected Claims 34-57 have been canceled without prejudice, and with the understanding that the subject matter thereof may be presented later in a continuation application.

By the present Amendment, independent Claim 1 has been amended to more clearly recite a method of providing indicia on a substrate in which the laser ablation portion on the substrate comprises a single layer of screen printed material having a thickness; at least a portion of the thickness of the single layer of screen printed material is removed during the laser ablating; and none of the substrate underlying the single layer of screen printed material is removed or damaged during the laser ablating.

Independent Claims 19 has similarly been amended to recite a method of providing indicia on automotive glass in which the laser ablation portion on the automotive glass comprises a single layer of screen printed material having a thickness; at least a portion of the thickness of the single layer of screen printed material is removed during the laser ablating; and none of the automotive glass underlying the single layer of screen printed material is removed or damaged during the laser ablating.

Basis for the amended language of Claims 1 and 19 is provided in the specification, for example, at page 11, lines 5 and 6, and Fig. 4b.

By the present Amendment, dependent Claims 58 and 59 have been added. These claims recite that the decorated portion and the laser ablation portion are separated from each other. Basis for the language of these claims is provided in the specification, for example, at page 5, lines 3-31, and Figs. 3a and 3b.

35 U.S.C. § 112 Rejections

Claims 2-6 and 20-24 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite due to the use of the word "step". By the present Amendment, the word "step" has been deleted from Claims 2-6 and 20-24.

Claims 17, 18, 32 and 33 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite due to a lack of antecedent basis for the phrase "the screen

printed material". By the present Amendment, independent Claims 1 and 19 have been amended to recite a "screen printed material". Accordingly, the phrase "the screen printed material" recited in Claims 17, 18, 32 and 33 has proper antecedent basis.

Claims 17, 18, 32 and 33 were further rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite due to the phrase "crystal seed powder". This rejection is respectfully traversed. The "crystal seed powder" is described in the specification, for example, at page 8, lines 3 and 4. As understood by those skilled in the art, the phrase "crystal seed powder" means a powder comprising crystalline particles which facilitate crystallization and solidification of the screen printed material during the firing operation. It is thus submitted that the phrase "crystal seed powder" has a clear meaning to those skilled in the art.

35 U.S.C. §§ 102 and 103 Rejections

Claims 1-2 and 9-10 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Heyman et al. '283. Claims 7-8 and 17-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heyman et al. '283. Claims 11-16, 19-20 and 25-33 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heyman et al. '283 in further view of Axtell III et al. '847. Claims 3-6 and 21-24 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Heyman et al. '283 in view of Axtell III et al. '847 and in further view of Boaz '486. It is submitted that independent Claims 1 and 19, as amended, distinguish over the applied references.

Heyman et al. '283 discloses workpieces having markings recessed into the surface thereof (see column 1, lines 51-53). In one embodiment, the workpiece comprises a main body and a thin surface coating integral with the main body. Material is selectively removed from defined areas of the surface, thereby producing marks recessed into the surface of the workpiece (see column 2, lines 5-11). In this embodiment, Heyman et al. '283 teaches that the marking is indented, e.g., abraded, through the coating (see column 2, lines 39-41 and Fig. 1). As described at column 5, line 68 to column 6, line 5, abrading may be carried with abrasive particles transported at

high velocity which remove the coating and which would also damage or remove some of the underlying substrate material upon impact.

In contrast, independent Claims 1 and 19, as amended, prohibit such removal or damage of the underlying substrate by reciting that none of the substrate is removed or damaged during ablation.

Heyman et al. '283 discloses another embodiment in which two coating layers having different visual characteristics are deposited on the workpiece, and the marks pass through the top coating and are recessed into but not through the undercoating (see column 1, lines 61-63 and column 2, lines 13-15). In this preferred embodiment of Heyman et al. '283, the undercoating provides a buffer layer so that the overcoating can be completely removed without having a laser beam impinge upon the underlying substrate during the ablation process (see column 6, lines 5-11). According to the reference, the underlayer thus acts as a buffer which prevents damage in the form of stresses from being set up in the glass substrate which lead to premature failure of the product (see column 6, lines 11-14).

Heyman et al. '283 thus teaches that although a single-layer coating may be used in one embodiment, the abrasion or ablation process of removing material damages the underlying substrate. In order to remedy this problem, the preferred embodiment of Heyman et al. '283 provides a contrasting underlayer which prevents substrate damage.

In contrast with the preferred multiple-layer embodiment disclosed by Heyman et al. '283, amended independent Claims 1 and 19 recite that the laser ablation portion comprises a single layer of screen printed material. This means that the screen printed material of the laser ablation portion has substantially the same composition or visual characteristics through its thickness. In contrast, the multi-layer embodiment of Heyman et al. '283 requires an underlayer having different visual characteristics from the overlayer.

Axtell III et al. '847 does not remedy the above-noted deficiencies of Heyman et al. '283. Axtell III et al. '847 discloses the use of a laser to adhere a material to a substrate in an area of laser irradiation, rather than laser ablation of a material as

presently claimed. Since Axtell III et al. '847 does not teach or suggest the claimed laser ablation methods, the present claims are patentable over Heyman et al. '283 alone, or in combination with Axtell III et al. '847.

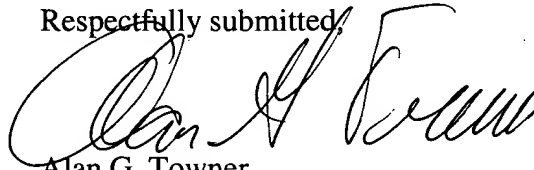
Boaz '486 does not remedy the above-noted deficiencies of Heyman et al. '283 and Axtell III et al. '847. Boaz '486 discloses the application of an opaque screening area to a glass sheet but does not teach or suggest the presently claimed laser ablation methods.

Newly added dependent Claims 58 and 59 recite that the decorated portion and the laser ablation portion are separated from each other. In contrast, Heyman et al. '283 does not include a "decorated portion" as presently claimed. Instead, Heyman et al. '283 discloses a coated portion (element number 18 in Fig. 1 and element number 28 in Fig. 2) which is continuous with and forms part of a bar code. The coated portion of Heyman et al. '283 is the same as the bar code region. Even if such a coating of Heyman et al. '283 could be considered a "decorative portion", it is not separated from the "laser ablation portion" as recited in Claims 58 and 59. Accordingly, the features of dependent Claims 58 and 59 further distinguish over the prior art of record.

In view of the foregoing amendments and remarks, it is submitted that the application meets the requirements of 35 U.S.C. § 112, and Claims 1-33, 58 and 59 are patentable over the prior art of record. Accordingly, an early notice of allowance of this application is respectfully requested.

In the event that any outstanding matters remain in connection with this application, the Examiner is invited to telephone the undersigned at (412) 263-4340 to discuss such matters.

Respectfully submitted,



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